

COVID-19 PANDEMIC – RAEB'S EVIDENCE UPDATE

Highlights of health research evidence synthesized by the
Research, Analysis and Evaluation Branch (RAEB)

• April 26, 2021 •

FEATURED

- Evidence products produced with our partners
- Research evidence and jurisdictional experience
- Trusted resources

ABOUT RAEB

Through research funding, brokering, translating, and sharing, we promote an enhanced evidence use capacity that supports all aspects of health policy, programming, and investment decision making.

Services include:

- Literature reviews
- Jurisdictional scans
- Economic analysis
- Evaluation planning
- Research fund management
- Knowledge translation services

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EVIDENCE PRODUCTS PRODUCED WITH OUR PARTNERS

The COVID-19 Evidence Synthesis Network is comprised of groups specializing in evidence synthesis and knowledge translation. The group has committed to provide their expertise to provide high-quality, relevant, and timely synthesized research evidence about COVID-19 to inform decision makers as the pandemic continues. Please contact [Evidence Synthesis Unit](#) for the full read of these evidence products.

- **Impact of Nighttime Curfews on Mobility and Transmission**

(Produced in collaboration with the Science Advisory Table, McMaster Health Forum, and Trillium Health Partners)

- Impact on Mobility: A curfew in Quebec was associated with an immediate reduction in nighttime mobility (31% relative reduction) compared to that of Ontario, which did not have a similar curfew. In France, curfews led to citizens' increased mobility, suggesting that curfews should be imposed based on an analysis of the local situation.
- Impact on Transmission: Research suggests that curfews reduce COVID-19 transmission, particularly when they are implemented alongside other public health measures. In 54 countries and four epicenters of the COVID-19 pandemic that used stay-at-home orders, curfews, or lockdowns, the percent increase in daily new cases reduced to <5% within one month. However, two studies suggest that containment measures including curfews may not be effective at the household level (i.e., among family members).
- Negative Impacts: Curfews have been associated with diminished social relationships, reduced use of health care services for non-COVID-19 patients (e.g., those with pulmonary embolism), increased violence, decreased physical activity, and increased anxiety and depression. A recent study suggests that curfews appear to have impacts that are somewhat inequitable (i.e., smaller mobility reductions in neighbourhoods with lower socioeconomic status and higher proportions of essential workers).
- Implementation: While some curfews are imposed nation-wide (e.g., France, Netherlands), others have been targeted to specific cities, states, or regions, such as in Australia (i.e., Melbourne only), Quebec (i.e., Montreal and several municipalities), India (e.g., New Delhi), and several US states.
- Public Responses: Media reports have documented public protests to curfews in many jurisdictions (i.e., Australia, France, India, Netherlands). Public opinion polls showing support for curfews range from 54% in France (April 2021) to 72% in Australia (August 2020). Support for curfews in the Netherlands may be waning.

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE

The research evidence profiled below was selected from highly esteemed academic journals and grey literature sources, based on date of publication and potential applicability or interest to the Ontario health sector.

UNDERSTANDING THE DISEASE

- **Nature: Prevalence and prognostic associations of cardiac abnormalities among hospitalized COVID-19 patients**
[Apr 19, 2021](#). This systematic review and meta-analysis found that despite significant heterogeneity in most comparisons, there is a trend towards definite increase in mortality or severity risk among COVID-19 patients with any cardiac abnormality test. Due to the high uncertainty in the pooled prevalence and/or incidence of cardiac abnormalities and the unquantifiable magnitude of risk (although an increased risk is certain) for severity or mortality among COVID-19 patients, much more long-term prognostic studies are needed to check for the long-term complications of COVID-19 and formalize definitive criteria of “COVID-19 associated cardiomyopathy”. [Read](#).
- **WHO: Asthma and COVID-19**
[Apr 19, 2021](#). This rapid systematic review concluded that it is unclear whether asthma increases risk of infection or severe outcomes from COVID-19. Systematic reviews do not detect a clear increase in risk. High-quality primary studies report conflicting results in some areas, and considerable uncertainty persists. Within people with asthma and COVID-19, people with comorbid chronic obstructive pulmonary disease, and people with non-allergic (compared to allergic) asthma appear more vulnerable to worse outcomes. Older age and non-white ethnicity also appear to confer greater risk within people with asthma, as would be expected from data from the general population. Data on medication use is difficult to interpret due to inconsistent findings across primary studies and possible confounding/collinearity between asthma severity and medication prescribed, with some data suggesting an increased risk in people with more severe asthma. [Read](#).
- **Lancet: COVID-19 patients retesting positive for RT-PCR**
[Apr 16, 2021](#). This systematic review and meta-analysis examined the clinical characteristics and possible causes and risk factors of COVID-19 patients that have retested positive after discharge. The existing risk factors suggest that more attention should be paid to patients with severe symptoms, elderly patients, and patients with co-morbidities. The causes and risk factors of retested positive results in discharged patients are not fully understood and more clinical studies are needed to investigate these issues. [Read](#).
- **Lancet: SARS-CoV-2 seropositivity and subsequent infection risk in healthy young adults in the US**
[Apr 15, 2021](#). This follow-up study to the [COVID-19 Health Action Response for Marines study](#) (2020) investigated the risk of subsequent SARS-CoV-2 infection among young adults who were seropositive for a previous infection. Following a four-week quarantine, seropositive young adults (aged 18-20 yrs.) had approximately one-fifth the risk of subsequent infection compared with seronegative individuals. Although antibodies induced by initial infection are largely protective, they do not guarantee effective SARS-CoV-2 neutralization activity or immunity against subsequent infection. [Read](#).

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

TRANSMISSION

- **CMAJ: Infectivity of SARS-CoV-2 in children compared with adults**
[Apr 9, 2021](#). Using nasopharyngeal swabs from 305 COVID-19 cases in Manitoba between March and December 2020, this study compared the infectivity of SARS-CoV-2 in children (N=97, 10 yrs. and younger; N=78, 11–17 yrs.) and adults (N=130, ≥ 18 yrs). Compared with adults, children with SARS-CoV-2 positive nasopharyngeal swabs were less likely to grow virus in culture, and had higher cycle thresholds and lower viral concentrations, suggesting that children are not the main drivers of SARS-CoV-2 transmission. [Read](#).

DISEASE MANAGEMENT

- **WHO: COVID-19 and mandatory vaccination: Ethical considerations and caveats**
[Apr 13, 2021](#). This policy brief does not provide a position that endorses or opposes mandatory COVID-19 vaccination. Rather, it identifies important ethical considerations and caveats (e.g., necessity and proportionality, sufficient supply, public trust) that should be explicitly evaluated and discussed through ethical analysis by governments and/or institutional policymakers who may be considering mandates for COVID-19 vaccination. [Read](#).

DATA ANALYTICS, MODELLING AND MEASUREMENT

- **Nature: Optimal, near-optimal, and robust epidemic control**
[Apr 20, 2021](#). This study compares a theoretically optimal strategy for using a time-limited intervention to reduce the peak prevalence of a novel disease in the classic Susceptible-Infectious-Recovered epidemic model to show that broad classes of easier-to-implement strategies (e.g., quarantines, restaurant closures, physical distancing for fixed periods of time) can perform nearly as well as the theoretically optimal strategy. Small errors in timing, regardless of intervention type, produce large increases in peak prevalence indicating that for robust control, an intervention must be strong, early, and ideally sustained. [Read](#).
- **Journal of Hematology and Oncology: Impact of the COVID-19 pandemic on diagnosis, stage, and initial treatment of breast cancer in the Netherlands**
[Apr 17, 2021](#). From 2018/19 to 2020, this study found that breast cancer incidence declined across all age groups and tumor stages (except stage IV). Non-invasive, early-stage breast cancer was less likely to be treated within three months and invasive tumours were less likely to be treated initially by mastectomy with immediate reconstruction or by breast-conserving surgery. Only women diagnosed in weeks two to eight of 2020 experienced treatment delays. The incidence of breast cancer fell in early 2020 and treatment approaches adapted rapidly. More research is needed to assess how this has affected patient outcomes. [Read](#).

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

DATA ANALYTICS, MODELLING AND MEASUREMENT

- ***Nature*: SARS-CoV-2 shifting transmission dynamics and hidden reservoirs potentially limit efficacy of public health interventions in Italy**

[Apr 21, 2021](#). This study presents evidence of sustained viral spread among sporadic small transmission clusters acting as “hidden reservoirs” during summer 2020 in Italy. Mathematical modelling shows that increased mobility among residents eventually caused such clusters, thus driving up the number of infections and initiating a new epidemic wave. These results suggest that the efficacy of public health interventions is limited by the size and structure of epidemic reservoirs, which may warrant prioritization during vaccine deployment.

[Read](#).

PUBLIC HEALTH MEASURES

- ***Nature*: COVID-19 dynamics after a national immunization program with the BNT162b2 vaccine in Israel**

[Apr 19, 2021](#). This data analysis from the Israeli Ministry of Health (August 28, 2020 to February 24, 2021) calculated the number of new COVID-19 cases and hospitalizations after the vaccination campaign initiated on December 20, 2020. Accounting for a lockdown that started January 8, 2021, it was found that a larger and earlier decrease in COVID-19 cases and hospitalization was observed in individuals older than 60 years, followed by younger age groups, by the order of vaccination prioritization. This pattern was not observed in the September 2020 lockdown and was more pronounced in early-vaccinated cities. [Read](#).

INFECTION, PREVENTION AND CONTROL IN SPECIFIC SETTINGS

- ***International Journal of Indoor Environment and Health*: Effective design of barrier enclosure to contain aerosol emissions from COVID-19 patients**

[Apr 20, 2021](#). This study tested the effectiveness of barrier enclosures (typically mounted over the head, with and without suction) to contain aerosol emission from COVID-19 patients. Tests using a manikin demonstrated that with sufficient suction, it is possible to effectively contain aerosol from the manikin, reducing exposure outside the enclosure by 99% while a passive barrier without suction only reduces aerosol exposure by 60%. Given the growing evidence that COVID-19 is airborne, a well-designed barrier enclosure using readily available and cost-effective materials can provide additional protection for health care workers and minimize aerosol spread from COVID-19 patients. [Read](#).

RESEARCH EVIDENCE/JURISDICTIONAL EXPERIENCE cont'd

HEALTH EQUITY AND VULNERABLE POPULATIONS

- **Nature: Geographic differences in comorbidities and associated severity and mortality among individuals with COVID-19**
[Apr 20, 2021](#). This systematic review and meta-analysis examined geographical, age, and gender-related differences in the prevalence of comorbidities and associated severity and mortality rates among COVID-19 patients. Of 120 studies with 125,446 patients, the most prevalent comorbidities were hypertension (32%), obesity (25%), diabetes (18%), and cardiovascular disease (16%). Chronic kidney/other renal diseases (51%, 44%), cerebrovascular accident (43%, 44%), and cardiovascular disease (44%, 40%) patients had the highest proportion of COVID-19 severity and mortality respectively. The highest mortality rate was observed in studies with Latin American and European patients with any medical conditions, mostly older adults (≥ 65 years), and predominantly male patients. [Read](#).
- **CMAJ: The impact of COVID-19 on pregnancy outcomes**
[Apr 19, 2021](#). This systematic review of 42 studies suggested that compared with no SARS-CoV-2 infection in pregnancy, COVID-19 was associated with preeclampsia, preterm birth, and stillbirth. Compared with mild COVID-19, severe COVID-19 was strongly associated with preeclampsia, preterm birth, gestational diabetes, and low birth weight. [Read](#).
- **International Breastfeeding Journal: Impact of COVID-19 pandemic lockdown on exclusive breastfeeding in non-infected mothers**
[Apr 17, 2021](#). This study investigated the impact that Italy's COVID-19 lockdown had on breastfeeding in non-infected mothers. Of the 173 mother-baby dyads in the study, at discharge, 69.4% practiced exclusive breastfeeding compared to 97.7% studied in 2018. At 30 days, 54.3% exclusively breastfed compared to 76.3% in 2018; and at 90 days, 31.8% breastfed compared to 70.5%. Lockdown and home confinement led to a decrease of exclusively breastfeeding in the studied population. Results suggest that the hospital stay period is crucial in continuing exclusive breastfeeding at least for the first 30 days. [Read](#).

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TRUSTED RESOURCES

- The Evidence Synthesis Network (ESN) is a collaborative COVID-19 response initiative by Ontario's research and knowledge production community. The [ESN website](#) is a portal where research evidence requests can be made and includes previously completed ESN briefing notes.
- The [Ontario COVID-19 Science Advisory Table](#) is a group of scientific experts and health system leaders who evaluate and report on emerging evidence relevant to the COVID-19 pandemic, to inform Ontario's response to the pandemic.
- COVID-19 Evidence Network to support Decision-making (COVID-END) in Canada:
 - COVID-END is a time-limited network that brings together more than 50 of the world's leading evidence-synthesis, technology-assessment, and guideline development groups to support decision-making. In addition to Living Evidence Profiles, COVID-END produces Canadian and global spotlights and horizon scans on emerging issues, as well as hosting an inventory of best COVID-19 evidence syntheses from around the world. An up-to-date and comprehensive list of sources, organized by type of research evidence, is available on McMaster Health Forum's COVID-END [website](#).
 - The COVID-19 Evidence Spotlights from COVID-END provide updated information on COVID-19 responses with three types of products from COVID-END in Canada: 1) Canadian spotlights; 2) global spotlights; and 3) horizon scans. COVID-19 responses can include the full spectrum of public health measures, clinical management, health system arrangements, and economic and social responses. During the first half of April, contributing evidence-synthesis teams in [Canada](#) shared 14 completed evidence syntheses and five questions that they have newly taken on, and [globally](#), there are a number of emergent issues related to COVID-19 for which evidence syntheses are or will be needed ([see here](#)). To receive an email containing hyperlinks to these products twice a month, [subscribe here](#).

* Figures in the header: Transmission electron microscope image shows SARS-CoV-2, the virus that causes COVID-19, isolated from a patient in the United States. Virus particles are emerging from the surface of cells cultured in the lab. The spikes on the outer edge of the virus particles give coronaviruses their name, crown-like. *National Institutes of Health's National Institute of Allergy and Infectious Diseases – Rocky Mountain Laboratories*